REMARKS

At the outset, Applicant thanks the Examiner for the thorough review and consideration of the subject application. The Non-Final Office Action of January 14, 2004 has been received and contents carefully reviewed.

In the Non-Final Office Action, the Examiner rejected claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Ohi (U.S. Patent No. 5,604,511) in view of the related art shown in Figure 1.

The rejection of claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Ohi in view of the related art shown in Figure 1 is, however, traversed and reconsideration is respectfully requested.

Independent claim 1 is allowable over Ohi in view of the related art shown in Figure 1 in that claim 1 recites a combination of elements including, for example, "a timing controller having an input terminal for receiving the control signals transmitted from the host system and having an output terminal; a frequency detector connected to any one of the input terminal or the output terminal of the timing controller to detect the transmitted signals; compensation voltage setting means for compensating the driving voltage in response to the control signals detected by the frequency detector so as to adjust a charge time of the thin film transistors; and a digital to digital converter for generating a compensation voltage set by the compensation voltage setting means..." Neither Ohi nor the related art shown in Figure 1, singly or in combination, teach or suggest at least these features of claim 1. Accordingly, Applicant respectfully submits that claims 2 and 3, which depend from claim 1 are also allowable over Ohi in view of the related art shown in Figure 1.

Independent claim 4 is allowable over Ohi in view of the related art shown in Figure 1 in that claim 4 recites a combination of elements including, for example, "detecting the control signals from any one of an input terminal and an output terminal of a timing controller...; setting a compensation voltage for compensating the driving voltage in response to the detected control signals so as to adjust a charge time of the thin film transistors." Neither Ohi nor the related art shown in Figure 1, singly or in combination, teach or suggest at least these features of claim 4. Accordingly, Applicant respectfully submits that claims 5 and 6, which depend from claim 4 are also allowable over Ohi in view of the related art shown in Figure 1.

Independent claim 7 is allowable over Ohi in view of the related art shown in Figure 1 in that claim 7 recites a combination of elements including, for example, "a timing controller receiving external control signals and controlling a timing of scanning signals; a frequency detector detecting a frequency of at least one of the external control signals; a voltage compensator receiving the detected frequency and generating therefrom a compensation voltage control signal; and a voltage converter receiving the compensation voltage control signal and a reference voltage for driving the scanning lines of the LCD panel and in response thereto generating a compensated voltage for driving the scanning lines..." Neither Ohi nor the related art shown in Figure 1, singly or in combination, teach or suggest at least these features of claim 7. Accordingly, Applicant respectfully submits that claims 8-12, which depend from claim 7 are also allowable over Ohi in view of the related art shown in Figure 1.

Independent claim 13 is allowable over Ohi in view of the related art shown in Figure 1 in that claim 13 recites a combination of elements including, for example, "receiving external control signals for controlling a timing of scanning signals; detecting a frequency of at least one of the external control signals; generating a compensation voltage control signal according to the detected frequency; and employing the compensation voltage control signal to generate a compensated driving voltage for driving the scanning lines..." Neither Ohi nor the related art shown in Figure 1, singly or in combination, teach or suggest at least these features of claim 13. Accordingly, Applicant respectfully submits that claims 14-19, which depend from claim 13 are also allowable over Ohi in view of the related art shown in Figure 1.

In rejecting claims 1 and 7, the Examiner cites Ohi as teaching "video signals N1 having a frequency which is lower than the frequency of the RGB video signal (detecting the frequency), [and] a compensation voltage for compensating the brightness of the voltage in response to a control signal (col. 4, lines 46-59, figs 3 and 4)."

Applicant respectfully submits, however, that Ohi teaches with respect to Figures 3 and 4, at column 4, lines 14-59,

> "Referring to FIG. 3... an embodiment of the active matrix liquid crystal display apparatus... includes an LCD panel 9 having a number of pixel electrodes 13 arranged in the form of a matrix, and a vertical driver circuit 10 and upper and lower side horizontal driver circuits 11 and 12 for driving the LCD panel 9.

> Furthermore, the shown embodiment includes a sample-hold circuit 1 receiving a red signal R, a green signal G and a blue signal B for performing a level shifting, amplification and sample-holding of the received signals... and a controller 4 for controlling the above mentioned various circuits....
>
> As shown in FIGS. 3 and 4, the RGB signal (representative of the red signal R, the green signal G and the blue signal B) is supplied to the sample-hold circuit 1, and after the RGB signal is inverted and amplified to the inverted and amplified RGB signal (FIG. 4), the inverted and amplified RGB signal is sampled and held in the sample-hold circuit 1. As a result, the RGB signal is serial-parallel converted to video signals N1. As clearly shown in FIG. 4, the video signals N1 have a frequency which is lower than the frequency of the analog RGB video signal. These serial-parallel converted video signals N1 are supplied to the gamma conversion circuit 2 in which a correction for a reverse gamma (γ) conversion at an image pick-up side (transmitter side) and compensation of the brightness-voltage characteristics of the liquid crystal are performed."

Accordingly, regardless of the fact that Ohi teaches "video signals N1 having a frequency which is lower than the frequency of the RGB video signal," as asserted by the Examiner, Applicant respectfully submits Ohi is silent as to "a frequency detector connected to any one of the input terminal or the output terminal of the timing controller to detect the transmitted signals," as recited in claim 1, and "a frequency detector detecting a frequency of at least one of the external control signals," as recited in claim 7. Stated another way, that Ohi allegedly teaches "video signals N1 having a frequency which is lower than the frequency of the RGB video signal" does not mean Ohi also teaches "a frequency detector connected to any one of the input terminal or the output terminal of the timing controller to detect the... signals [transmitted from the host system]," as required in claim 1, or "a frequency detector detecting a frequency of at least one of the external control signals [received by the timing controller]," as required by claim 7.

Further, and regardless of the fact that Ohi allegedly teaches "a compensation voltage for compensating the brightness of the voltage in response to a control signal," as asserted by the Examiner, Applicant respectfully submits Ohi is silent as to "compensation voltage setting means for compensating the driving voltage in response to the control signals detected

by the frequency detector so as to adjust a charge time of the thin film transistors," as recited in claim 1, and "a voltage compensator receiving the detected frequency and generating therefrom a compensation voltage control signal," as recited in claim 7. Stated another way, that Ohi allegedly teaches "a compensation voltage for compensating the brightness of the voltage in response to a control signal" does not mean Ohi also teaches "compensation voltage setting means for compensating the driving voltage [applied from a host system] in response to the control signals [transmitted from the host system, received by the timing controller and] detected by the frequency detector so as to adjust a charge time of the thin film transistors," as required in claim 1, or "a voltage compensator receiving the detected frequency [of at least one of the external control signals received by the timing controller and detected by the frequency detector] and generating therefrom a compensation voltage control signal," as required by claim 7.

Accordingly, for at least the reasons set forth above, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 103(a).

In continuing the general rejection of claims 1-19, and while specifically referring to claims 1 and 7, the Examiner correctly acknowledges that Ohi "does not teach digital-to-digital converter for generating a compensation voltage and deliver it to the liquid crystal display panel." The Examiner then attempts to cure this deficiency of Ohi by citing the related art shown in Figure 1 as teaching "a voltage converter 14 (digital-to-digital converter) capable of delivering the compensation voltage from Ohi's device to the liquid crystal display panel as claimed."

Applicant respectfully submits, however, that the voltage converter 14 of the related art shown in Figure 1 merely "applies a gate high voltage (Vgh) for driving the TFTs within the liquid crystal display panel 22 to the gate driver 20, and generates a common electrode voltage Vcom for the liquid crystal display panel 22 to apply it to the gate driver 20" (see present specification at page 3, lines 7-9). Further the present specification also states referring to Figure 2, that "when a gate high voltage (Vgh) applied to the TFT has a constant value of 18V, a common voltage Vcom also has a constant value of 5V and a frame frequency is changed from 50Hz to 60Hz, a charge time T of the TFT is decreased from 22μs (T1) to 18μs (T2) and, at the same time, a gate voltage width Gw is decreased from Gw1 to Gw2. Thus, a data pulse applied to the TFT fails to reach a saturation state to cause a

discharge. Therefore, the TFT fails to make a sufficient discharge to reduce the charge rate and generate a variation in a picture quality" (see present specification at page 3, lines 18-23). In light of the actual teachings of the related art shown in Figure 1, Applicant respectfully submits that the related art shown in Figure 1 fails to teach "a voltage converter 14 (digital-to-digital converter) capable of delivering the compensation voltage from Ohi's device to the liquid crystal display panel," as asserted by the Examiner nor does the related art shown in Figure 1 teach or even suggest "a digital to digital converter for generating a compensation voltage set by the compensation voltage setting means," as recited in claim 1, or "a voltage converter receiving the compensation voltage control signal and a reference voltage for driving the scanning lines of the LCD panel and in response thereto generating a compensated voltage for driving the scanning lines," as recited in claim 7.

Accordingly, for at least the reasons set forth above, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 103(a).

In concluding the rejection of claims 1-19, and while specifically referring to claims 1 and 7, the Examiner states it would have been obvious to use "the voltage converter... as disclosed in the... [related art shown in Figure 1] into the device of Ohi because it would be capable of providing high voltage as well as low voltage to the liquid crystal display and therefore improve reliability of the compensation signal going into the display panel."

Assuming *arguendo* that the related art shown in Figure 1 even shows the digital-to-digital converter and voltage converter specifically as recited in claims 1 and 7, Applicant respectfully submits that there is no is motivation or suggestion to arrive at the claimed combination of elements.

To reiterate, claim 1 requires, among other elements, "a digital to digital converter for generating a compensation voltage set by the compensation voltage setting means," and claim 7 requires, among other elements, "a voltage converter receiving the compensation voltage control signal and a reference voltage for driving the scanning lines of the LCD panel and in response thereto generating a compensated voltage for driving the scanning lines." The voltage converter 14 of the related art shown in Figure 1 is connected directly between the gate driver 20 and the timing controller 12 (see Figure 1). Similarly, the controller 4 of Ohi is connected directly to the V-driver 10. Given that Ohi is silent as to any components between the controller 4 and the V-driver 10, Applicant respectfully submits that whatever element of

Ohi allegedly reads on the claimed compensation voltage setting means (see claim 1) and voltage compensator (see claim 7) is not connected directly between the controller 4 and the V-driver 10. Accordingly, even if the voltage converter 14 of the related art shown in Figure 1 were successfully combined into the apparatus of Ohi, the combination would still not meet each and every claimed element.

Accordingly, for at least the reasons set forth above, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 103(a).

In rejecting claim 4, the Examiner states "this is a method corresponding to the apparatus of claim 1 and is therefore rejected on the same basis set forth in claim 1."

Applicant respectfully submits, however, Ohi in view of the related art shown in Figure 1 fails to teach or suggest at least the aforementioned combination of elements. Similar arguments made above with respect to the rejection of claims 1 and 7 are applicable to the rejection claim 4.

In rejecting claim 13, the Examiner states "this is a method corresponding to the apparatus of claim 1 and is therefore rejected on the same basis set forth in claim 7."

Applicant respectfully submits, however, Ohi in view of the related art shown in Figure 1 fails to teach or suggest at least the aforementioned combination of elements. Similar arguments made above with respect to the rejection of claims 1, 4, and 7 are applicable to the rejection claim 13.

If the Examiner deems that a telephone conversation would further the prosecution of this application, the Examiner is invited to call the undersigned at (202) 496-7500.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

Date: June 3, 2004

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